

CLAIMSWHAT IS CLAIMED:

- 546
all
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1. An apparatus, comprising:
a server adapted to receive and store at least one request to modify the behavior of an implantable medical device provided by a programmer adapted to allow a clinician to create the at least one request at a first selected time;
a monitor adapted to receive the requests from the server and transmit the requests to the implantable medical device at a second selected time; and
a bi-directional communications system adapted to couple the server and the monitor.
 2. The apparatus of claim 1, wherein the server is further adapted to verify that the clinician is authorized to submit requests to the implantable medical device.
 3. The apparatus of claim 2, wherein the bi-directional communication system is adapted to provide a secure communication link between the server and the monitor.
 4. The apparatus of claim 1, wherein the monitor is adapted to decrypt requests.
 5. The apparatus of claim 5, wherein the monitor is adapted to transmit decrypted requests to the implantable medical device using a radio frequency transmitter.
 6. The apparatus of claim 5, wherein the implantable medical device is adapted to receive decrypted requests using a radio frequency receiver.
 7. The apparatus of claim 1, wherein the second selected time is substantially later than the first selected time.

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8. The apparatus of claim 1, wherein the monitor is adapted to transmit the decrypted requests to a plurality of implantable medical devices.

9. The apparatus of claim 8, wherein the server is further adapted to allow the clinician to submit requests to at least one of the plurality of implantable medical devices.

10. An apparatus, comprising:

a programmer adapted to allow a clinician to create, at a first selected time, a plurality of requests to modify the operation of at least one of a plurality of implantable medical devices;

a server at a first selected location adapted to receive, store, and encrypt the requests, wherein the server is further adapted to verify that the clinician is authorized to submit requests to the at least one of the plurality of implantable medical devices;

a monitor at a second selected location adapted to receive and decrypt the requests from the server and transmit the requests to the at least one of the plurality of implantable medical device at a second selected time; and

a secure bi-directional communications system adapted to enable the server and the monitor to exchange encrypted information.

11. The apparatus of claim 10, wherein the secure bi-directional communications system comprises a Virtual Private Network.

12. The apparatus of claim 10, wherein the secure bi-directional communications system comprises a Secure Socket Layer connection.

13. The apparatus of claim 10, wherein the monitor comprises a radio frequency transmitter adapted to transmit the request to the at least one of a plurality of implantable medical devices.

14. The apparatus of claim 13, wherein the plurality of implantable medical devices comprise a plurality of radio frequency receivers adapted to receive requests from the monitor.

15. The apparatus of claim 10, wherein the second selected time is substantially later than the first selected time.

16. A method, comprising:
programming at a first selected time at least one request to modify the operation of an implantable medical device;
storing the request at a first selected location;
transmitting the request from the first selected location at a second selected time to a second selected location; and
transmitting the request from the second selected location to the implantable medical device.

17. The method of claim 16, wherein programming comprises authorizing a clinician to create the at least one request.

18. The method of claim 17, wherein programming further comprises selecting the implantable medical device from among a plurality of implantable medical devices that the clinician is authorized to program.

19. The method of claim 16, wherein transmitting the request from the first selected location to the second selected location comprises forming a secure communication link between the first selected location and the second selected location.

20. The method of claim 19, wherein forming a secure connection comprises forming a Virtual Private Network connection.

21. The method of claim 20, wherein forming a secure connection comprises forming a Secure Socket Layer connection.

22. The method of claim 19, wherein transmitting the request from the first selected location further comprises encrypting the request at the first location.

23. The method of claim 22, wherein transmitting the request from the first selected location to the second selected location further comprises transmitting the encrypted request from the first selected location to the second selected location using the secure connection.

24. The method of claim 23, wherein transmitting the request from the first selected location to the second selected location further comprises decrypting the request at the second selected location.

25. The method of claim 24, wherein transmitting the request from the first selected location to the second selected location comprises retrieving the request at a second selected time that is substantially later than the first selected time.

26. A method, comprising:

creating, at a first selected time, at least one request to modify the operation of an implantable medical device using a programmer;

storing the request on a server at a first selected location;

encrypting the request on the server at a second selected time in response to notification that a monitor at a second location is substantially ready to receive the request;

transmitting the encrypted request from the server to the monitor through a secure bi-directional communications network;

decrypting the request on the monitor; and

transmitting the request from the monitor to the implantable medical device using a radio frequency transmitter.

27. The method of claim 26, wherein creating the request comprises authorizing a clinician to create a request;

28. The method of claim 26, wherein transmitting the encrypted request from the server to the monitor through a secure bi-directional communications network comprises transmitting the encrypted request through a Virtual Private Network.

29. The method of claim 26, wherein transmitting the encrypted request from the server to the monitor through a secure bi-directional communications network comprises transmitting the encrypted request through a Secure Socket Layer.

30. A system, comprising:

a programmer adapted to allow a clinician to create, at a first selected time, a plurality of requests to modify the behavior of at least one of a plurality of implantable medical devices adapted to deliver therapies to at least one of a plurality of patients;

a secure bi-directional communication network;

a server coupled to the bi-directional communication network at a first location and adapted to receive, store, and encrypt the requests, wherein the server is also adapted to verify that the clinician is authorized to submit requests to the at least one of the plurality of implantable medical devices; and

a plurality of monitors coupled to the bi-directional communication network at a plurality of second selected locations and adapted to receive and decrypt the requests from the server and transmit, at a plurality of second selected times, the requests to the at least one of the plurality of implantable medical devices.

31. The system of claim 30, wherein the bi-directional communications network comprises at least one of a telephone line, an intranet, an internet, a satellite, and a global positioning system.

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